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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/524,551

Applicant(s)

WISTMULLER, AXEL

Examiner

SAIF A. ALHIJA

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-22, 28-32, 39 and 40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-22, 28-32, 39 and 40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 October 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/10/08.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 18-22, 28-32, and 39-40 have been presented for examination.
Claims 1-17, 23-27, and 33-38 have been cancelled.
Claims 39-40 are newly presented.

Response to Arguments

2. Applicant's arguments filed 10 October 2008 have been fully considered but they are not persuasive.

NON-PRIOR ART ARGUMENTS

- i) The Examiner acknowledges Applicants correction of the inventor's name, Abstract, Specification (except for improper incorporation. See below), and Drawings.
- ii) The Examiner acknowledges the cancellation of claims 33-36 rendering the claim objections moot.
- iii) The Examiner acknowledges the cancellation of claims 23-27, and 33-38 rendering the 101 rejections of those claims moot. However with respect to the remaining presented claims 18-22, 28-32, and 39-40 the Examiner notes that Applicants argue that the methods recited are useful and therefore claim patentable subject matter. The Examiner notes that the 101 rejection was provided since the claims produce neither a concrete or tangible result and mere utility does not result in a claim to be rendered statutory. **Therefore the 101 rejections are MAINTAINED. See below.**

PRIOR ART ARGUMENTS

- v) Applicants argue that the reference does not teach "providing data objects of the exploration space which are independent of the input data." However the Examiner notes that the reference recites the resolution of shifted and distorted patterns of the input data into a resolved input map, page 55 left. It is noted that the mechanism to resolve the data discrepancy are procured from the HCM and not from the input data since the provided input data is skewed. Further the reference recites on page 50 left column, a solution in which the original images were not used as input data but rather a Euclidean and mahalanobis distance between the input and eigenfaces therefore not entirely input dependent. Finally the Examiner notes that the claim recites an "or" clause and as such the Examiner

has cited a portion of the reference which reads on “**determining the order of neurons in the ordering space by using at least a part of the provided data objects**” specifically Page 55, top right.

Therefore the prior art rejection is **MAINTAINED**.

EXAMINERS NOTES

vi) Examiner has cited particular columns and line numbers in the references applied to the claims for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

vii) The Examiner respectfully requests, in the event the Applicants choose to amend or add new claims, that such claims and their limitations be directly mapped to the specification, which provides support for the subject matter. This will assist in expediting compact prosecution.

viii) Further, the Examiner respectfully encourages Applicants to direct the specificity of their response with regards to this office action to the broadest reasonable interpretation of the claims as presented. This will avoid issues that would delay prosecution such as limitations not explicitly presented in the claims, intended use statements that carry no patentable weight, mere allegations of patentability, and novelty that is not clearly expressed.

ix) The Examiner also respectfully requests Applicants, in the event they choose to amend, to supply a clean version of the presented claims in addition to the marked-up copy in order to avoid potential inaccuracies with the version of the claims that would be examined.

Specification

The amendment filed 10 October 2008 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: Applicants have stated that the references listed in the specification were not

intended to be incorporated by reference. Therefore, the newly inserted text corresponding to the listed references in the specification is considered new matter.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

MPEP 2106 recites:

The claimed invention as a whole must accomplish a practical application. That is, it must produce a "useful, concrete and tangible result" State Street 149 F.3d at 1373, 47 USPQ2d at 1601-02. A process that consists solely of the manipulation of an abstract idea is not concrete or tangibles. See *In re Warmerdam*, 33 F.3d 1354, 1360, 31 USPQ2d 1754, 1759 (Fed.Cir. 1994). See also *Schrader*, 22 F.3d at 295, 30 USPQ2d at 1459.

3. Claims 18-22, 28-32, and 39-40 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

i) The Courts have found that subject matter that is not a practical application or use of an idea, a law of nature or a natural phenomenon is not patentable. As the Supreme Court has made clear, "[a]n idea of itself is not patentable," *Rubber-Tip Pencil Co. v. Howard*, 20 U.S. (7 Wall.) 498, 507 (1874); taking several abstract ideas and manipulating them together adds nothing to the basic equation. *In re Warmerdam*, 31 USPQ2d 1754 (Fed. Cir. 1994).

The language of the claims indicate that the claims are directed merely to an abstract idea that is not tied to a technologic art, environment, or machine that would conclude with a **tangible result** to form the basis of statutory subject matter under 35 USC 101. The claimed methods appear to be no more than

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manipulation of mathematical equations and data manipulation without **any application or tangible output**, therefore the claims are rejected under 35 USC 101.

iii) The Examiner notes that paragraph 27 of the specification of the instant application states "signals transmitted in a network." **Signals are non-statutory and therefore the Examiner requests clarification as to how the method claims do not encompass the recited signals.**

Appropriate correction is required.

All claims dependent upon a rejected base claim are rejected by virtue of their dependency.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 18-22, 28-32, and 39-40 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Tsuruta et al. "Hypercolumn Model: A Combination Model of Hierarchical Self-Organizing Maps and Neocognitron for Image Recognition."**

Regarding Claim 18:

The reference discloses A method of generating codebook objects for an artificial neural network from input data, the method to be executed on a data processing device and comprising the following steps:

(a) providing data objects to be processed as input data; (**Section 4.1.1, “target objects as input data”**)

(b) generating a topology-preserving mapping, by: (**Section 4.1.1, “top layer preserves the topographic order”**)

(i) ordering neurons in ordering space, according to a given pattern; (**Section 4.1.2, SOM and HCM and neuron**)

(ii) assigning codebook objects in outcome space to the neurons; (**Section 3.1, HCM and codebooks**)

(iii) processing codebook objects according to the calculation rule of a topology-preserving mapping, by use of data objects of the exploration space; (**Section 3.1, code-book vectors and preserving the topographic order of continuous locale**) and

(iv) outputting the processed codebook objects as output data; said method characterized by comprising at least one of the following steps; (**Figure 9c and 9d, output**)

(c) determining the order of neurons in the ordering space by using at least a part of the provided data objects, and (**Page 55, top right**)

(d) providing data objects of the exploration space which are independent of the input data. (**Section 2.1, “A characteristic of the SOM is that the distance between neurons and the neighborhood for each neuron are defined independently of the data space.”**)

Regarding Claim 19:

The reference discloses The method of claim 18, wherein the data objects to be processed are distance objects. (**Section 2.1, equation 1, Euclidean distance**)

Regarding Claim 20:

The reference discloses The method of claim 18, wherein data objects in the ordering space are ordered irregularly. (**Figure 2**)

Regarding Claim 21:

The reference discloses The method of claim 18, wherein data objects of at least one of the ordering space, exploration space, and outcome space are used which comply with at least one of the following conditions: (A) they satisfy a non-Euclidian geometry; (B) they are distance objects to data objects of a local neighborhood of data objects; (**Section 2.1, "A characteristic of the SOM is that the distance between neurons and the neighborhood for each neuron are defined independently of the data space."**) (C) they represent data distributions with a fractal dimension; (D) they represent data distributions of non-orientable surfaces in the sense of differential geometry; (E) they are added, omitted or modified during the training processes or a series of training processes of the topology-preserving mapping, in particular for distance objects in the ordering space; (F) they are influenced by additional constraints; (G) they are saved or processed in local units; and (H) they are added, omitted or modified after completion of the training of the topology-preserving mapping.

Regarding Claim 22:

The reference discloses The method of claim 18, wherein at least one of the calculation rule of the topology-preserving mapping and at least one parameter of this calculation rule: is chosen depending on the respective processed data object of at least one of the ordering space, exploration space and outcome space; is modified during the training process or over several training processes of the topology-preserving mapping, in particular depending on the respective processed data object of at least one of the ordering space, exploration space, and outcome space; and is influenced by additional constraints. (**Section 2.1, "In the learning phase, each time a training data item is input, the winner is selected according to Eq. (1) and is trained according to the following equations:"**)

Regarding Claim 28:

The reference discloses A method of determining the cluster validity of an artificial network, the method to be executed on a data processing device and comprising the following steps:

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- (a) providing data objects as input data; **(Section 4.1.1, “target objects as input data”)**
- (b) providing distance objects between these data objects; **(Section 2.1, equation 1, Euclidean distance)**
- (c) providing an assignment of the data objects to be processed to groups by: **(Table 2, “Neuron groups”)**
 - (i) processing provided data objects by using a topology-preserving mapping, by: **(Section 4.1.1, “top layer preserves the topographic order”)**
 - (1) ordering neurons in ordering space, according to a given pattern; **(Section 4.1.2, SOM and HCM and neuron)**
 - (2) assigning codebook objects in outcome space to the neurons; **(Section 3.1, HCM and codebooks)**
 - (3) processing codebook objects according to the calculation rule of a topology-preserving mapping, by use of data objects of the exploration; **(Section 3.1, code-book vectors and preserving the topographic order of continuous locale)**
 - (4) outputting the processed codebook objects as output data; **(Figure 9c and 9d, output)**
 - (ii) at least one of the following substeps (1) and (2):
 - (1) determining the order of neurons in the ordering space by using at least a part of the provided data objects; **(Page 55, top right)**
 - (2) providing said data objects that are independent of the input data to be processed and which are used as data objects of the exploration space; **(Section 2.1, “A characteristic of the SOM is that the distance between neurons and the neighborhood for each neuron are defined independently of the data space.”)** and
- (d) outputting a measure of the quality of this assignment as output data, said method characterized by the step of: **(Page 56, top right, “The quality of the topographic mapping was estimated using two parameters D1 and D2.)**
- (e) calculating the measure of the quality of the assignment by employing at least a part of the provided distance objects. **(Page 56, top right, “The quality of the topographic mapping was**

estimated using two parameters D1 and D2.)

Regarding Claim 29:

The reference discloses The method of claim 28 wherein step (e) comprises the steps of:

(f) providing data objects to be processed as input data; (**Section 4.1.1, “target objects as input data”**)

(g) processing provided data objects by using a topology-preserving mapping; (**Section 4.1.1, “top layer preserves the topographic order”**) and

(h) applying a cost function of a method for the clustering of dissimilarity data, wherein the measure of the quality of the assignment is calculated by using at least one set of the set of substeps (h) (i) and h(ii) and the set of substeps (h) (iii)(h) (vi) and a cost function of a method for the clustering of dissimilarity data: (**Page 56, top right, “The quality of the topographic mapping was estimated using two parameters D1 and D2. Page 54, bottom left, computational cost**)

(i) processing provided dissimilarity data objects by using a topology-preserving mapping, by: (**Section 4.1.1, “top layer preserves the topographic order”**)

(1) ordering neurons in ordering space, according to a given pattern; (**Page 50, bottom left, “pattern recognition”**)

(2) assigning codebook objects in outcome space to the neurons; (**Section 3.1, HCM and codebooks**)

(3) processing codebook objects according to the calculation rule of a topology-preserving mapping, by use of data objects of the exploration; (**Section 3.1, code-book vectors and preserving the topographic order of continuous locale**)

(4) outputting the processed codebook objects as output data; (ii) at least one of the following substeps (1) and (2) (**Figure 9c and 9d, output**)

(1) determining the order of neurons in the ordering space by using at least a part of the provided dissimilarity data objects; and (**Page 55, top right**)

(2) providing said dissimilarity data objects that are independent of the input data to be processed and which are used as data objects of the exploration space; **(Section 2.1, "A characteristic of the SOM is that the distance between neurons and the neighborhood for each neuron are defined independently of the data space.")** and

(iii) providing dissimilarity data objects to be processed; **(Page 50, top left, images with large variations)**

(iv) calculating distances between the dissimilarity data objects to be processed as distance objects; **(Section 2.1, "In the learning phase, each time a training data item is input, the winner is selected according to Eq. (1) and is trained according to the following equations:").**

(v) outputting these distance objects as output data; **(Figure 9c and 9d, output)**

(vi) calculating the distances by use of at least one of statistical learning methods, local models, methods of inferential statistics, and one of the following specific computation methods: (A) Levenstein Measure; (B) Mutual information; (C) Kullback-Leibler Divergence; (D) coherence measures employed in signal processing, in particular for biosignals; (E) LPC cepstral distance; (F) calculation methods that relate the power spectra of two signals, such as the Itakura-Saito Distance; (G) the Mahalanobis-Distance; **(Page 50, "Mahalanobis distance")** and (H) calculation methods relating to the phase-synchronization of oscillators.

Regarding Claim 30:

The reference discloses The method of claim 28, which is carried out repeatedly, wherein the output data of a previous run of the procedure are entered as input data of a subsequent run of the procedure. **(Figure 4, subnetworks)**

Regarding Claim 31:

The reference discloses The method of claim 28, comprising the step of: (f) determining the quality of the output data and outputting this determined quality. **(Page 56, top right, "The quality of the topographic mapping was estimated using two parameters D1 and D2.")**

Regarding Claim 32:

The reference discloses The method of claim 31 wherein the quality is determined by at least one of: (A) calculating measures for topology-preservation or distribution-preservation; (**Section 4.1.1, "top layer preserves the topographic order"**) (B) calculating distortion measures; (C) relating the distance of data objects in the ordering space to the distances of corresponding data objects in at least one of the outcome space and the exploration space, in particular by plotting these data objects in a distance plot; (D) graphically displaying data objects of at least one of the exploration space, the outcome space and the ordering space, in particular by applying these data objects to at least one of an exploration, outcome and ordering plot; (E) graphically displaying data objects calculated from data objects of at least one of the exploration space, outcome space and ordering space, in particular by plotting these object data ill at least one of an exploration plot, outcome plot and ordering plot; (F) calculating and outputting the mapping error for at least one of an interpolation, extrapolation, approximation and supervised learning, in particular by forward and backward projection; and (G) sequential processing of data objects.

Regarding Claim 39

The reference discloses The method of claim 18 wherein step (d) comprises the step of:
(e) generating the data objects of the exploration space according to a structural hypothesis.
(**Figure 4 and 5. Section 2.3, NC, learning, and feature map**)

Regarding Claim 40

The reference discloses The method of claim 28 wherein step (c) (ii) (2) comprises the step of:
(e) generating the data objects of the exploration space according to a structural hypothesis.
(**Figure 4 and 5. Section 2.3, NC, learning, and feature map**)

Conclusion.

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. All Claims are rejected.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAIF A. ALHIJA whose telephone number is (571)272-8635. The examiner can normally be reached on M-F, 11:00-7:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571) 272-22792279. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. *Informal or draft communication, please label PROPOSED or DRAFT*, can be additionally sent to the Examiners fax phone number, (571) 273-8635.

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SAA

December 31, 2008

/Hugh Jones/
Primary Examiner, Art Unit 2128